AA RESEARCH NEWS

May 87

EDITORIAL

Excellence in Agronomic Advisory Service

In recent times, the key catch word in management circles has been 'excellence'. An analysis of excellence in respect of agronomic advisory services in plantation crops in Malaysia is appropriate now as this is AAR's central role and function. Excellent agronomic advice should enable the achievement of highest yields with the lowest costs and inputs within the shortest time frame giving the best profits per unit area cultivated.

So what is an excellent agronomic advisory service? And how can this be recognised?

The best agronomic advisory services are all results-oriented. For a start, therefore, the agronomic advisory service should be able to advise competently on all major aspects of cultivation of the crops involved i..e from selection of planting materials to the best methods of harvesting or exploitation of the crop. The **agronomists** must be able to evaluate and analyse the agronomic and management factors which affect growth and yield performance of crops in their various specific situations then and in the future. Following this, they should be able to formulate practical and economic measures with the management to avoid, remove or minimise the constraints to growth and yield to achieve the best possible results.

The skills involve a broad knowledge of all the agricultural disciplines and estate management practices, a good and thorough knowledge of the crops, their agronomy and the environment. Adequate, accurate and up-to-date relevant records and analytical data on the crop and environment are essential.

Exposure to extensive and extreme crop situations, crop literature and involvement in research are valuable experience which can be brought to bear in analysis of agronomic factors affecting results.

As a different team with complementary expertise is involved in implementing recommendations, the **agronomists** should be able to clearly and accurately convey their views of the nature of the constraints involved to the Management and VA's/PA's and the basis of their advices, for action. This is to actively involve the Management in the formulation and agreement on the best course of action. Such discussion should preferably be on the ground and a decision reached prior to the departure of the **agronomists** from the estate.

Finally, good reporting systems both to and from the estates should be established. The agronomic reports and recommendations should be timely, concise, clearly written and deal with specific problems and areas. Estates are encouraged to provide the necessary feed-back information for their progress in the estates to be monitored and quick appropriate responses and follow-up by the **agronomists** are the hall-marks of an excellent agronomic service.

All ideas fail without good personnel or without an appropriate environment of encouragement and support. The **agronomists** cannot achieve good results without support and interaction with the Management and VA's/PA's who take the final decisions in implementation of tasks on the estates. Good rapport and inter-change of information between the three parties are necessary and must be encouraged for their common objective of improvement and increased profitability of the estates to be achieved.

Current AAR services are designed to be results-oriented, with specific recommendations according to individual circumstances. High priority is placed on an overall agronomic approach e.g. fertiliser recommendations are made after evaluation of all agronomic factors affecting growth, yield and nutrient requirements and not just on leaf analysis results alone. Correction of the basic problems is emphasised and economic appraisal carried out for major cost items whenever possible. Care is taken to present an accurate account of the actual situations encountered and to explain the reasons for the recommendations made.

Although there is now a large pool of commercial and research experience amongst the research officers, steps are taken to ensure continued high technical competence of the staff by their active participation in technical and professional activities at national and international levels. Relevant research programmes to provide information and experience in important areas affecting performance of the clients' estates and active breeding and selection programmes for various crops have been drawn up.

AAR will strive to build up an excellent agronomic advisory service. It is looking into ways to further improve current standard of services and will try to maintain a continually high level of technical competence of its staff. Co-operation and collaboration with the **Estate Managements** and VA's/PA's is continually stressed and continued feed-back by all concerned on AAR services and performance will be encouraged. AAR does not want to be another run-of-the mill agronomic advisory unit. We want to be excellent and we want to see results!

P. S. Chew

FEATURE ARTICLES

AAR Recommendations of Rubber Clones 1987 - 1991

1. Introduction

The right choice of clones is the single most important factor affecting the overall rubber estate yield. Its impact often lasts for long duration if not for the whole economic life-span of the planting. Classical examples of widely planted clones which turned out to be mediocre yielders were Tjir 1, RRIM501 and PB5/51 compared to RRIM 600. Nevertheless it is not easy to spot the "winner"clone due to:-

a) the long time required to obtain conclusive proof of the high yielding ability of a clone and

b) clone-environment interactions in respect of the secondary characteristics eg. resistance to wind and leaf disease(s), which may result in variable clonal performance between planting regions.

c) the rather unfortunate insufficient experimental data on the performance of current promising clones as compared to RRIM 600, reflecting the very slow progress in the breeding and selection of new planting materials.These clonal recommendations are made despite this deficiency, using the following procedures.

2. Procedures for choice of clones

The following procedures are used when deciding on the choice of clones for planting :-

a) Characterise the estates into planting regions based on the history of wind damage and leaf disease incidences. Proximity to prevailing wind belts, depth of the soil, type of terrain and the rainfall pattern are the influencing factors.

b) Classify the selected clones based on yields, secondary characteristics and past performances. Selected clones must have increasing or sustained high yields with preference to clones which shows yield precocity or good response to stimulation or low intensity tapping. The main secondary characteristics concerned are resistance to wind damage and leaf disease(s), although growth vigour, latex properties and timber yield are also given some emphasis.

c) Based on the best possible compatibility of clone and the environment of the planting region i.e. enviromax principle, plan for wide scale planting of well-proven Class I clone(s). Subsequently allow for smaller scale planting of moderately proven Class II clone(s) and inadequately proven Class III clone(s), in regions where their yields are expected to exceed that of existing Class I clones. These Class II or Class III clones should be planted in

HIGHLIGHTS

Editorial	:	Excellence in Agronomic Advisory Service
Articles	:	AAR Recommendations of Rubber clones.
		Are U READY for UREA?
Crop News	:	Oil Palm Yield Trends.
		Cocoa Cropping Pattern in Sandakan.
P & D News	:	Pest Control Profile - Leaf Eating Caterpillars
Conference News	:	Management of the Cocoa Pod Borer

discrete blocks alongside Class I clones for direct comparisons and will subsequently be upgraded to Class I for wide scale planting if their overall performance is confirmed to be up to expectation.

3. Characteristics of Planting Regions

The important features affecting rubber yields for each region are drawn up based on the history of wind damage and leaf disease incidences. These are tabulated for the Principals' estate as follows:—

Region	Estates in	Town near to estate	Incidence of			
			Wind damage	Colleto-trichum	Oidium	Phytop-h thera
(1)	Kedah	Kulim	L	L	L–H	No
(2)	Kedah/ Perak	Serdang, Taiping	M	M–H	M	No
(3)	Perak	K. Kangsar, Parit, Ipoh	L–M	L	M	No
(4)	Perak/ Selangor	Kampar, Rawang	M	H	M	No
(5)	Selangor/ N. Sembilan	Kajang-Tampin	L–M	L	M	No
(6)	N. Sembilan	Bahau	L	L	L–M	No
(7)	Malacca	Nyalas	M–H	L	M	No
(8)	Johore	Segamat	L–H	M	M	No
(9)	Johore	Kluang	M	M	M	No
(10)	Johore	Johore Baru	L–M	H	M	No
(11)	Pahang	K. Lipis, Lanchang Mengkarak	L–M	L–M	M	No
(12)	Pahang	Telemong	M	L–M	M	No
(13)	Kelantan	K. Krai	L–M	L	L	L/M

Key to codes: L = low M = moderate H = high

4. Classification of clones

The criteria used for classification of recommended clones are given below:

Class	Past performance	Risk	Scale of commercial planting	Avail. yield data		Mean for 1st 10 yrs.	Secondary charac-teristics	Other remarks
				Trial	Commercial			
1	well-proven	Little	Wide	Good	Good	> 2000 kg/ha/yr	Good	Include well proven clone. Good for restricted region.
2	Mod. proven	Mod.	Mod.	High	High	> 2000 kg/ha/yr	Inadequate information	Restrict planting to specific region
3	Indequately proven	High	Limited	V. high	V. high to unknown	> 2200 kg/ha/yr		

Expected peak yield for:—

Panel B0–1 = 2600 kg/ha/yr
Panel B0–2 = 3500 kg/ha/yr

3A. Very promising trial &/or commercial yield available up to Panel B0–2

3B. Very promising trial yield only

5. AAR Clonal Recommendations 1987–1991

The following are the clones recommended for planting for the period 1987–1991 following the approach detailed above.

Clonal Class	Recommended clones	Planting Region												
		1	2	3	4	5	6	7	8	9	10	11	12	13
1	PB260	+	++	+	++	+	+	+	+	++	++	+	+	+
	PB217	++	+	++	+	+	++	++	++	+	+	++	+	
	RRIM600	+	+	+	+	+	+	+	+	+	+	+	+	
	PB28/59	+	+											
2	PB235	+												+
3A	PB254	+			++		+							+
	PB280	+												+
	PB255	+												+
	PM10	+		+		+	+	+				+	+	+
3B	PB330	+		+	+	+	+		+	+	+	+		+
	PB314	+		+	+	+	+		+	+	+	+		+
	PC51	+	+	+	+	+	+	+	+	+	+	+	+	+
	PC57	+		+	+	+	+		+	+	+	+		+

N.B.: 1) + Recommended ++ Preferentially Recommended

2) Underlined clones should not be planted in fields prone to wind damage &/or with hilly/steep terrain and shallow soils.

6. Concluding Remarks

The choice of clones is under constant review and will be formally updated periodically. Managers' views and observations on the clones are of course very important in the assessment.

T. S. Ong

B. Are U READY for UREA?

Urea N, the fertiliser source with the highest nutrient content, is now produced in Malaysia at the ASEAN Bintulu urea plant in Sarawak.

In their paper, Chew and Pushparajah (see Abstract on Page 8) reviewed the available results from usage of urea in plantation crops and concluded that urea should be as effective as other N-sources if volatilisation losses from the fertilizer can be minimised.

AAR research has shown that when urea is broadcast on the soil surface at effective N concentration of 500 kg N/ha (rate equivalent to 1 kg urea per palm broadcast evenly over the oil palm circle area), volatilisation losses between 42 to 48% of the N content in the urea may be incurred after 7 days over a wide range of soils. The ammonia is lost to the air rapidly and is unavailable to the plants. After volatilisation losses, the effective urea N is therefo only about 27%.

Many factors affect volatilisation loss of urea when it is broadcast on the soil surface and measures to overcome these losses were identified. To use urea successfully, i.e. minimise volatilisation losses and obtain consistent results with the fertiliser, **Agronomists** and the **Management** need to evaluate each plantation to check on the suitability of the fields, modifications of planting practices and techniques of application required. Also **Management** has to concentrate on :

1) correct conditions in the area for urea application;

2) timing in relation to soil moisture and possibility of rain and

3) ensuring that correct application techniques are followed.

The check-list of factors affecting suitability and management objectives for urea application are listed in Tables 1 and 2. The most effective technique to reduce volatilisation losses is to bury the urea. It is,however, impractical over large areas.. Broadcast applications will be required. **Management** must therefore ensure that objectives in Table 2 can be met to minimise volatilisation losses and variability of results to gain real advantages from using urea.

We shall be interested to hear the views of **Managers** on the practicability and possibility of implementation of these measures suggested for efficient usage of urea over large hectarages.

TABLE 1: CHECK-LIST OF SUITABILITY OF SOIL AND ENVIRONMENTAL FACTORS IN EACH MANURING BLOCK

Factors	Conditions for urea application		
	Favourable	Marginal	Unsuitable
Crop canopy cover	Complete	Partial	Open
Ground cover	Bare soil		Thick
Litter on application area	Nil		Thick
Concentration on application area (effective concentration)	< 100 kg N/ha	100–250 kg N/ha	> 250 kg N/ha
Soil CEC (me/100 gm)	> 15	10–15	< 10
Soil texture	clay to silty clay	sandy clay	sandy clay loam
Soil surface characteristics	friable	friable to firm	firm and hard
Soil pH	< 4.5	4.6–6.5	> 6.5

TABLE 2: MANAGEMENT OBJECTIVES FOR UREA APPLICATION

	Favourable	Unsuitable
Urea form/characteristics	free-flowing	lumpy & caked
Area of application	Minimal organic debris/ litter or dense vegetation	
Effective N concentration	< 100 kg N/ha	
Timing to completion of manuring block	1 day	
Timing to soil moisture content	> 60% whc[1]	< 30% whc
Timing to rainfall	within 1 day	outside 3 days
Application method	Broadcast & rake or bury	Banding or spot applications

N.B.: [1] whc = water-holding capacity

P.S. Chew

CROP NEWS

A. Oil Palm Yield Trends

Introduction

The oil palm yield trends in different geographical/climatic regions in Peninsular Malaysia were not entirely similar as indicated by the monthly yield data of four randomly selected estates ie. Estate A (Sg. Buloh), Estate B (Kluang), Estate C (Kelantan) and Estate D (South Kedah), over the last five years. Palms of different ages in the same region could have different monthly yield patterns.

1. Annual Estate Yields

The average estate yield for the four estates from 1982 to 1986 ranged from 15.6 to 25.4 tonnes/ha. Almost all the plantings in the four estates were fully mature.

2. Monthly Yield Trend (Fig.1)

The trough yields occurred during the first half of the year ie. January - June, and were much lower in Estate C and Estate B as compared to Estate D and Estate A. The yield recovery usually began in April/May.

The higher yield period was during the second half of the year ie. July-December, and usually peaked in September/October. In a reasonably good cropping year, peak monthly yields exceed 2.5 tonnes/ha. and since 1984, all the four estates experienced only one peak yield period each year.
Estate C, which has a monsoonal climate, (very high rainfall followed by extremely dry period each year) has more pronounced peak and trough yields.

3. Monthly Yield Trends for Different Palm Ages (Figs. 2,3)

The monthly yield patterns for palms of very different ages were not entirely similar even in the same estate, as illustrated by Estate A 1968 and 1976 plantings in Fig. 2. The durations of peaks and troughs were usually different.

Fig. 1

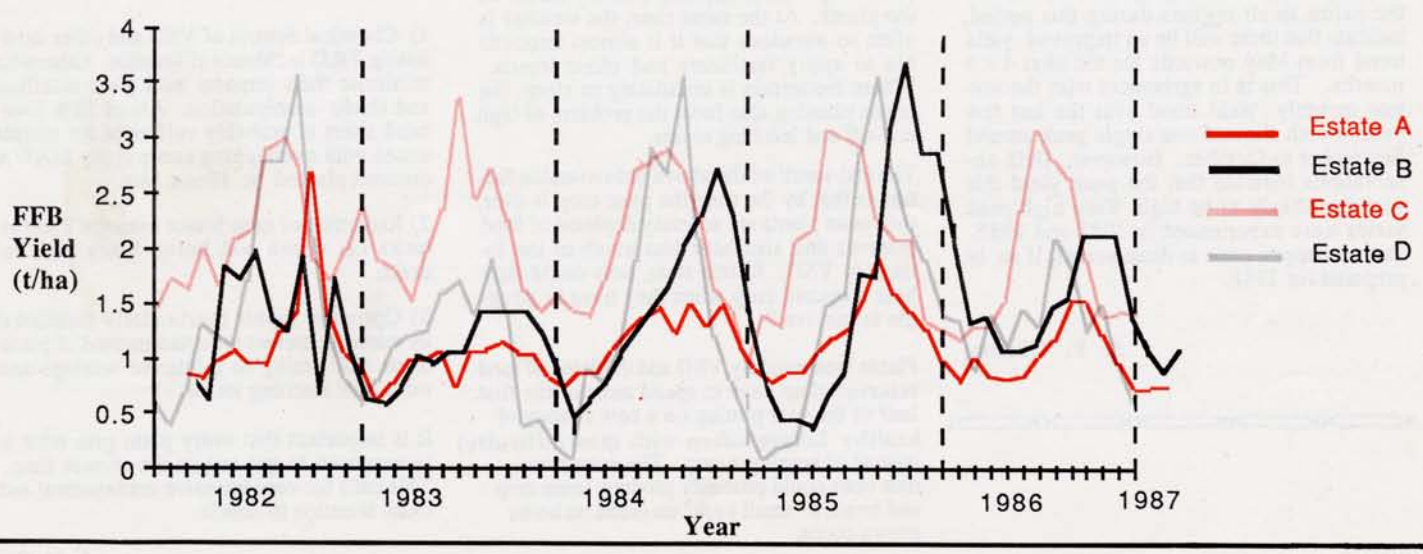


Fig. 2

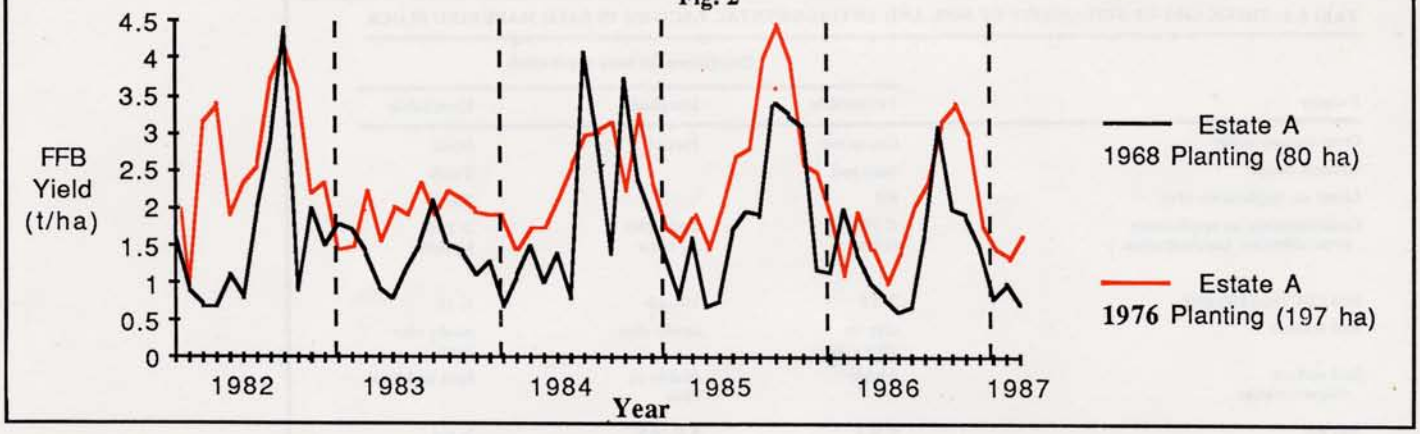
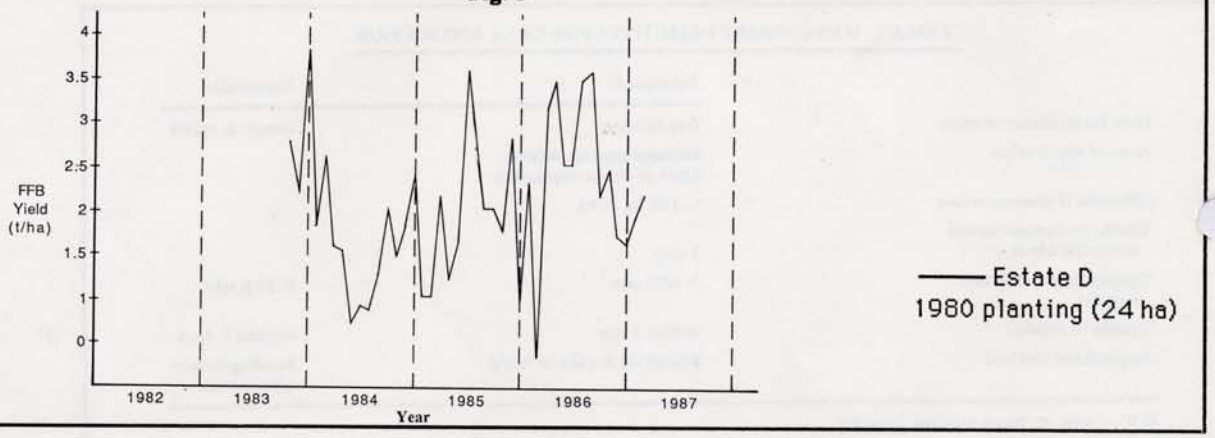


Fig. 3



Hence the yield performance of the estate can be very much influenced by its palm age composition.

In young mature plantings eg. Estate D 1980, monthly yield fluctuations were more erratic during the first two years of harvesting due to the effects of ablation as shown in Fig.3.

4. Current Trend

The low crop seen from January to April, 1987 coincides with the usual trough yield period. Estate C and other Kelantan estates may go through a longer trough period in view of the very low rainfall in the first half of 1986 which would have increased the inflorescence abortion rate. Estate in other regions should be better off.

5. Anticipated Yield Trend in 1987

Observations of developing fruit bunches on the palms in all regions during this period, indicate that there will be an improved yield trend from May onwards for the next 4 - 5 months. This is in agreement with the normal monthly yield trend over the last few years which showed one single peak around September to October. However, field observations indicate that the peak yield this year is unlikely to be high. Very high peak yields were experienced in 1982 and 1985. Does it happen once in three years? If so, be prepared for 1988.

S. P. Cheong

B. COCOA CROPPING PATTERN IN SANDAKAN - ONE OR TWO PEAKS?

It is not uncommon for one to hear cocoa planters in Sandakan lamenting that there is only one peak crop per year in Sandakan as compared to two in Tawau.

Why Only One Peak In Sandakan?

Our speculation is that the main culprit is the Sandakan weather which is much wetter than Tawau. The rainfall in Sandakan between October and January is particularly heavy and frequent.

The prolonged wet weather invariably causes an upsurge in Vascular Streak Dieback (VSD) incidence and severity, often to levels that cause severe terminal shoot dieback and defoliation.

Also, the same months coincide with the peak crop which imposes a heavy stress on the plants. At the same time, the weather is often so atrocious that it is almost impossible to apply fertilisers and other inputs. Where the terrain is undulating or steep, the cocoa planting also faces the problem of high run-off and leaching losses.

The end-result of the above unfavourable factors is that by the time the peak crop is over, the cocoa plants are severely depleted of food reserves and also have lost much of the foliage to VSD. In this state, how could they bear a second crop when they have to struggle to survive ?

Plants weakened by VSD and depleted of food reserves often have to spend most of the first half of the year putting on a new canopy of healthy foliage (often with great difficulty) instead of bearing a crop. The more fortunate ones could probably produce some crop and hence a "small peak" recorded on better grown cocoa.

Is There Any Hope?

The answer is "Yes!"
One could almost certainly get two peaks if one is able to maintain the cocoa in a healthy state throughout the year. This basically means controlling VSD in Sandakan. Of course, the other inputs i.e agronomic, pest and disease (P&D) control and **management** factors must also be in top gear.

Manjit (1987) has demonstrated that Triadimenol and PP969 are able to protect nursery and field planted cocoa for the duration of his experiment which was 15 months. Unfortunately, the efficacy of the fungicides on mature cocoa has yet to be proven. Apart from chemical control, nutritional and other agricultural inputs also need to be optimised to combat VSD and to maintain the cocoa in good health throughout the year to make two peaks a reality in Sandakan. In this respect the following areas deserve special attention :-

1) Chemical control of VSD and other debilitating P&D incidence if feasible. Otherwise minimise their impacts with good nutrition and shade manipulation. About 10% overhead share is probably sufficient for mature cocoa with overlapping canopy; say MAWA coconut planted at 18m x 18m

2) Reduction of crop losses to major P&D attacks i.e. cocoa pod borer, black pod, rodents.

3) Optimise inputs (particularly fertilisers) by ensuring correct rates and method of placement and timing to minimise wastage and run-off or leaching losses.

It is important that every plant gets what it is supposed to get and at the correct time. This calls for very intensive management and close attention to details.

L. H. Ooi

COMMODITY NEWS

Palm Oil

- that the world's production and consumption of selected oils ('000 tonnes) for 1986 were :-

Selected Oils	Production	Consumption	Av. Monthly Price (US$)
Soya Bean	14150	13989	346.3
Palm	7807	6325	340.0 (Olein) 290.0 (Crude)
Sunflower seed	7179	7590	330.7
Rapeseed	6342	7116	301.0
Cotton seed	3490	3547	495.9
Groundnut	3260	3018	325.0
Coconut	3080	3207	295.7
Palm kernel	1081	1056	380.0
Total :-	47389	45751	

- that for 1986, Malaysia exported **4,554, 778 tonnes** of palm oil valued at **M$3,097** million, **534,402 tonnes** of palm kernel oil valued at **M$334.9** million and **792,383 tonnes** of palm kernel cake valued at **M$182.7** million.

- that for 1986, the lowest local crude palm oil price was **M$446/tonne** in September and the highest was **M$725.5/tonne** in November.

- by the end of 1990 the annual production of crude palm oil by Sabah is expected to be around **573,400 tonnes.**

- that the industry (as reported by the Malay Mail) is of the general opinion that palm oil will remain a viable crop but it cannot expect the fat profit as it did in the yester-years. The Malaysian industry has no choice but to reduce cost, increase productivity and find new markets in order to compete favourably with low cost producers of palm oil and unfair trade practices by other vegetable oil producers.

The latest moves of the latter category which will further bind the hands of the Malaysian oil palm industry are the lobbying efforts of the American Soybean Association to label palm oil as a saturated fat by the U. S. Food and Drug Administration, and the European Economic Community to increase the tariff on vegetable oil imports, thus curbing the import of palm oil in these countries.

Cocoa

- cocoa which has not been enjoying good prices recently, is expected to get better prices, as the member producing and consuming nations of the London-based International Cocoa Organization have agreed on a price support plan; and have asked its buffer stock manager to buy cocoa in recent weeks (April).

Rubber

- MRRDB forecasts a 1.5% growth in world demand of rubber (SR + NR) to **13.7 million** tonnes in 1987.

- a study by Candell and Millions Commodities, London, for the year ended October, 1986, shows that total world natural rubber consumption of **4.31 million tonnes** exceeded total production by about 1% (45,000 m. tonnes)

- Malaysia produced **1.46 million tonnes** of NR in 1986, which fell 6% from 1985 due largely to the conversion of rubber to oil palm and other crops and adverse climatic conditions.

- during the first 10 months in 1986, Malaysia exported 1.21 million tonnes of NR, up 2.5% from the previous corresponding period. Total export for the whole of 1986 is estimated to be around **1.55 million tonnes**

- INRO buffer stock manager holds some 360,000 tonnes of rubber in the stock (about 25% of 1986 production). The maximum size of the stock as stipulated by INRA agreement is 550,000 tonnes.

- producing and consuming countries are negotiating a new INRA pact, the main obstacle of which is said to be the differing perception held by producers and consumers on the function of a new INRA. Malaysia, the leading NR producer and exporter wants the new pact to maintain prices to profitable levels, while consumers say a new accord should help stabilise prices but not at levels higher than those dictated by market forces.

- the short-term outlook for NR seems favourable with prices likely to stay above 220 cents per kg for RSS1 due to low stocks and depressed production over the current refoliation period. Demand from consumers especially in the West is also expected to increase for replenishing their inventories after the long year-end holidays and cold winter.

- MRELB said uncertainty about the fate of INRO and its buffer stock operations will cast a shadow over the market in the long term.

P & D NEWS

PEST CONTROL PROFILE 1: CONTROL OF LEAF-EATING CATERPILLARS ON OIL PALMS

1. Introduction

Leaf eating caterpillars are chronic pests of oil palm. When an outbreak occurs, it tends to recur periodically.

The more common species are :-

Bagworms	a) *Metisa plana*
	b) *Cremastopsysche pendula*
	c) *Mahasena corbetti*
Nettle caterpillars	a) *Setora nitens*
	b) *Ploneta diducta*
	c) *Thosea sp*
Tussock moths	a) *Dasychira sp*

2. Occurrence

These pests are always found in oil palms but are contained at very low population by natural control. Upsurgence of the pests into epidermic proportion may occur when the natural control fails.

The mechanism of the natural control of the pests is as yet not fully understood . However indiscriminate use of chemicals, especially those with broad spectrum action and long residual persistence, is known to cause imbalance in the pest -predator ecology which then favours the development of the pest outbreak .

The outbreaks are fairly predictable. They are usually initiated in late November and December (wet weather period) and the damage becomes noticeable in January and February (dry weather period). The belief that the outbreaks occur only during the dry weather period is only partially true. Experience shows that an outbreak may worsen even during the wet weather period.

3. Control programme

The objective of a control programme is to minimise the adverse effect on palm growth and fruit production due to defoliation by the pest.

The control programme for leaf-eating caterpillars on oil palm is fairly standard now and when implemented correctly, severe damage can always be avoided.

There are four essential elements in the control programme.

i) Pest surveillance

The objective is to detect an increased pest population early with continual vigilance. Vigilance should be increased during periods when an outbreak is most likely to occur i.e. from November to April.

The importance of continual surveillance is often overlooked. In many cases, an outbreak is detected too late when significant damage has happened.

ii) Systematic pest census

The objective of a systematic pest census is to determine :-

a) the pest distribution (i.e. areas infested)
b) the pest severity (i.e. pest population level)
c) the need for treatment

TABLE 1: TREATMENT APPLICATION METHODS

Equipment	Suitability	Coverage/manday	Other features
1. Knapsack sprayer	Nursery and sporadic outbreak on 1—2 years old palms	0.5—1.50 ha	Slow operation. Low spray reach.
2. Hydraulic or power sprayer	Nursery and palms up to 10 years	0.75—2 ha	Similar to knapsack sprayer except for higher spray reach. Very high spray rate, 350—600 l/ha. High chemical wastage.
3. Mistblower	Nursery and palms up to 4 years old	1—2 ha.	For palms older than 4 years old, spray coverage become progressively less satisfactory with palm height. Spray rate 10—100 l/ha.
4. Air-blast power sprayer	Palms up to 8—10 years old	8—12 ha.	Spraying speed depends on in-field access. Spray rate 50—500 l/ha. Correct spray angle important for good coverage.
5. Air craft sprayers	Large area of any palm age	400 ha.	High chemical wastage when spraying young palms when canopies have not closed. Cost is high but becomes competitive with ground application techniques at from 100—1000 ha. Obtaining operation permit may delay treatment commencement.

TABLE 2: INSECTICIDES RECOMMENDED FOR CONTROL OF OIL PALM LEAF EATING CATERPILLARS

Insecticide	Trade name	Concentration (a.i. %)	Acute oral LD50 (rats)	Acute percutaneous LD50	Recommendations: Pests	Application method	Application rate	Remarks
1. Trichlorfon	Dipterex	95%	560—630 mg/kg	200 mg/kg (rats)	a) bagworms b) nettle caterpillars c) Tussock moths	spraying	1 8 kg/ha	Contact and stomach insecticide with penetrant action (i.e. moves to plant tissue at application site). Low residue persistence. Not effective against bag worms in late larval instars.
2. Monocrotophos	Azodrin 60 WSC	55%	14 mg/kg	336 mg/kg (rats)	a) bagworms b) nettle caterpillars c) Tussock moths	trunk injection	10 ml neat/palm	**Not recommended for spraying** when trunk injection is possible due to effect on natural enemies and high mammalian toxicity. Systemic and contact action. Broad spectrum action. Unsafe to ecology.
3. Methamidophos	Tamaron 600 cc	50%	30 mg/kg	50—110 mg/kg (rats)	a) bagworms b) nettle caterpillars c) Tussock moths	trunk injection	a) 10 ml neat/palm b) 25 ml in 14 l. water	As for monocrotophos.
4. Phosmet	Imidan 50 WP	50%	113 mg/kg	> 5000 mg/kg (rabbits)	a) nettle caterpillars b) Tussock moths	spraying	224 g in 14 l. water	**Not effective against bagworms.** Contact and non-systemic. Safer than monocrotophos and methamidophos to ecology. Readily degraded in the environment.
5. Diflubenzuron	Dimilin 25 WP	25%	4640 mg/kg	> 2000 mg/kg (rabbits)	a) bagwarms b) nettle caterpillars c) Tussock moths	spraying	140 g.a.i./ha spray solution	Chitin-formation inhibition. Stomach/contact poison. No systemic activity. Safer to ecology.

Assessment of an outbreak through *adhoc* checks or observations will not give an accurate indication of an outbreak situation especially when large hectarage is involved and when the old and the fresh pest damage overlap.

As time is the essence in the control of leaf-eating caterpillars, when increased pest activities are noted a quick check should be carried by senior staff members in all the affected and surrounding areas to determine the need for treatment which should be implemented immediately when required. If the check does not gives clear indication of the need for treatment then a systematic census should be implemented.

iii) Treatment application

The objective of the treatment application is to stop further damage through quick kill of the pests.

Treatment application is required when the pest population exceeds 4 active caterpillars per frond.

Good timing ensures treatment efficacy. Timing (i.e. the stage of pests at which treatment is applied) not only affects treatment efficacy but also the choice of treatment application method and the pesticide.

The recommended treatment application methods are given in Table 1.

The **trunk injection** method is preferred and should be used as far as possible. It agrees well with the integrated pest control approach and is highly effective even when the pest populations widely overlap.

The recommended pesticides are given in Table 2.

Treatment should be completed by the middle caterpillar instar stage. Delayed treatment completion results in further damage due to the voracious feeding habit of the advanced instar caterpillars . However, if delay cannot be avoided, treatment should continue even up to the final caterpillar instar stage and only spraying or mistblowing should be used. Trunk injection will be less effective due to its slow effect and a significant number of caterpillars will escape treatment and pupate.

iv) Systematic post treatment census

The objective of a **systematic post-treatment census** is to evaluate:-

a) the treatment efficacy

b) the need for retreatment

Failure to carry out post-treatment census often results in unneccessary severe damage due to failure to carry out retreatment when required.

4) Conclusion

Leaf-eating caterpillars of oil palm are relatively simple pests in that they easily sucumb to treatment when correctly done. The treatment method of these pests has now become fairly standard.

The essence in an effective control programme is the need to attend to all the essential elements of the control programme; good timing of treatment application and correct technique of treatment application. Very often, only limited time is available to implement control programmes and as such any action required should be implemented immediately and also under good supervision to avoid the need for retreatment.

Mohd Mat Min

PESTICIDE CONTAMINATION OF VEGETABLES

Just recently, contamination of vegetables from one vegetable growing area by high levels of fungicide residue was a hot issue. The fungicide concerned was *dithiocarbamate*

Dithiocarbamate is very popular among vegetables and fruits farmers and is sold under not less than 20 trade names. At high temperatures, e.g. during cooking, it produces *ethylene thiourea* which is carcinogenic on laboratory test animals.

Vegetables are highly susceptible to pest and disease damage. Profitable vegetable farming is much dependent on pesticides which are applied to the field vegetables by the farmers and to the harvested vegetables by the wholesalers. Although no pesticide application to the vegetables is allowed less than 14 days before harvesting, the farmers are very reluctant to risk losing their crops at this final stage of production especially during wet weather which is conducive for fungal infection and which reduces the effect of previous pesticide application. Therefore, the health risks of injudicious application of pesticides by the vegetable farmers is borne by the consumers. The consumers could minimise the risks through :-

1) growing their own vegetables;

2) avoid buying vegetables covered with whitish greyish powder which is mostly fungicide and

3) thorough washing of vegetables before cooking or keeping in the refrigerator; preferably soak the vegetables in water overnight (the oily film on water that may appear next morning is most likely insecticide).

Mohd Mat Min

AAR NEWS

A. AAR Computer Section

Computers are already firmly entrenched in the office enviroment and well on the way of encroaching into our homes (if it has not already done so!).

Here at AAR, microcomputers have proved to be most invaluable. Our typists have cast aside their old faithfuls for these new-found loves. Letters and reports are literally flowing off our printers with relative ease and speed. Apart from word processing and the Estimates (Budget) other items being computerised are the statistical analysis of AAR trial data, checkroll, accounts and eventually a database covering the relevant records of all the estates under our advisory service for swifter performance monitoring and problem solving.

For the computer buffs among you, the hardware we are using are the Data-mini IBM PC XT compatibles. We have both the XT and the Turbo models and they use the 8088 and 8088-2 16 - bit microprocessor respectively. We do our printing on the Epsom LX86 and the 132 col. Star NB15. Both are dot matrix printers with near-letter quality capabilities.

Our IBM compatibles are 'heavy duty' and licensed compatibles, able to endure office usage. Thus they are more expensive than other models available which are mainly for home use. For example, our XT compatible costs $2500 with a monochrome monitor. A similar system but recommended for home use would cost only about $1600 currently, (home usage here means that the computer is subjected to less vigorous usage). And for around $2800, you can get a reasonable colour monitor and an Epson LX86 printer or equivalent thrown in.

The software or programmes that we use are mainly by the word-processor; Wordstar, the spread-sheet: Lotus 1-2-3 (Release 2) and the database; DBase III (now DBase III Plus). We find these three programmes together with our own statistics programmes are more than adequate to handle our current requirements. Programmes like Wordstar and Lotus 1-2-3 are relatively easy to learn and most of our staff are able to be fairly proficient in these programmes without the need to attend any courses in them. DBase III, however, needs more time and effort and perhaps courses might be necessary to master it, especially the programming aspects . Above all, constant usage of the softwares is necessary to be proficient in them.

Finally, feel free to contact us on any queries on microcomputers and software. We will try our best to help you.

C. C. Tan

B. Orchids Anyone?

Our tissue culture laboratory is offering tissue culture services to orchid growers. For a very reasonable fee, we undertake to multiply by tissue culture techniques any suitable plant which the orchid grower brings to us. For a start, we already have a few clients from around the Subang and Sg. Buloh areas.

To make it attractive for orchid producers and growers to come to us, we offer assurance on the security and protection of our client's interest; their plants will be safe with us and we will not keep any of their materials on fulfilling their orders. Besides, our modern laboratory facilities will add to our attractiveness.

The laboratory is also experimenting into other plants of horticultural interest and will consider commercial propagation proposals from all interested parties.

C. C. Tan

C. AAR Sports Club

AAR Sports Club was officially formed on October 30, 1986 with the following elected as office-bearers :

President	- Soh Aik Chin
Vice-President	- Goh Kah Joo
Secretary	- Joyce Chong
Treasurer	- See Choon Mooi

The Club boasts of a membership of about 80 strength and has facilities within the Complex for indoor games e.g. carroms, darts, chess, table-tennis, and outdoor games e.g. volleyball, netball, excellent surrounding grounds for cross-country runs, hashing and indoor and outdoor parties. The Club can also tap the excellent sport facilities e.g. football field, badminton hall, of RRIM and FRIM, which are in the vicinity of the Complex.

Todate, the Club had two parties (Getting-To-Know-You and New Year parties), and had friendly matches with Taiko s Process Control Laboratory (badminton), H.R.U. (football) and Ebor Research (football and netball). Programmes are currently being planned to have an annual games series with the Sports Clubs of Boustead Estate Agency and Taiko Plantations' separately. Excursion trips and parties are also being planned besides further friendly games and matches.

A. C. Soh

CONFERENCE NEWS

SYMPOSIUM ON MANAGEMENT OF THE COCOA POD BORER, *Conopomorpha cramerella*

1. Introduction

The one day (3rd March 1987) symposium organised by the Malaysian Plant Protection Society was the first of its kind in Malaysia. This symposium was very timely in view of the need to disseminate knowledge gained through research and experiences in Sabah to manage the recently confirmed cocoa pod borer occurrence in Peninsular Malaysia.

Ten papers were presented.

2. Highlights

The papers may be grouped into three broad subject matters : viz. Experience with the Cocoa Pod Borer (2 papers); Control Measures (6 papers) and Prospect for Future Cocoa Pod Borer Management (1 paper)

2.1 Experience with the Cocoa Pod Borer

Despite stringent control or eradication measures ie. "rampasan" and intensive chemical sprayings carried out in Sabah after the initial cocoa pod borer detection, the pest continued to spread. During the initial two years, borer spread was slow but by the third year, the borer was recorded in almost all cocoa growing areas.

Initial detection of the cocoa pod borer, which is a low density pest, is extremely difficult. By the time infestation is noticed, large areas would have already been affected.

2.2 Cocoa Pod Borer Control

Several means of cocoa pod borer control, viz. chemical control, cultural or physical control, biological control and use of host plant resistance, were presented.

Of these control measures, chemical, cultural and physical control combination gives the best result, and is being widely practiced. Basically, this technique involves :-

a)chemical spraying when and where required;

b)harvesting at 7-10 days;

c)pod harvested at first sign of yellowing;

d)pod-husk bagging.

Judicious chemical application is emphasised as continuous and indiscriminate insecticide use poses a very serious threat to the insect ecology. In this respect, the **'GIRAM SYSTEM'** of cocoa pod borer monitoring to determine need of chemical control together with; pod borer census on every 20th row at 7-10 days and carrying out selective chemical spraying to areas where the borer infestation exceeds the threshold level together with cultural control can restrict crop to loss to below 5%.

Cocoa pod borer trapping with synthetic sex pheromone does not give effective control but should be a useful tool for monitoring the borer population.

Studies of control using host plant tolerance and biological control are still at the early development stage.

3. Conclusion

Experiences in Sabah and from the initial cocoa pod borer incidence in Peninsular Malaysia strongly indicate that the cocoa pod borer will be a permanent feature of the cocoa in Peninsula Malaysia.

With proper control techniques, crop loss to the borer can be limited to below 5% level. Of the control measures presented, chemical and cultural control combination is most widely practised and gives satisfactory results when properly implemented. Correct timing and judicious implementation of chemical spraying are essential. In this regard, a systematic cocoa pod borer monitoring system is necessary as with any other endemic insect pest, and the **GIRAM SYSTEM** appears suitable.

Mohd Mat Min

AAR TECHNICAL PAPERS 1987 (JAN - MAY)

AAR Technical Papers are internal reports and papers of technical nature, some of which, if they are of a scientific nature and of general interest, may be submitted for publication in professional journals or presented at professional meetings.

3/87 A review of planting densities in Hevea

CWH

SUMMARY

A review of planting densities was carried out with a view to arriving at optimum planting densities for current clones recommended based on agronomic and economic considerations.

The inhibitory effect of planting density on girthing commenced at around the fourth year of immaturity, continuing into the mature phase until the seventh year of tapping before reaching a stable state. Different groupings of planting densities according to girth differences have been distinguished. Increased planting density tended to increase height of lowest branch, reduce crown depth and shorten time of canopy closure. There was generally little association of planting density with outbreak of diseases, dryness and wind-damage. Percentage tappability and yield per tree were decreased while number of tappable trees and yield per ha.were increased when planting density was increased.

An initial planting stand of 400 trees/ha. gave the most profitable return at rubber prices ranging from $2.50 to $4.00/kg. Under current enviromental and managerial constraints, higher initial planting densities are however recommended. For clones which show an apparent higher propensity to tree dryness e.g. PB235, 260, an initial planting density of 440 trees/ha.is recommended. For other recommended clones with reportedly lower dryness incidence, e.g. RRIM600 and PB217, a lower initial stand of 422 trees/ha.is suggested. With advanced planting materials i.e. APM's, the corresponding recommended initial planting densities are 403 and 383 trees/ha. For steep terrain with slopes exceeding 25°, the initial stand per ha.could be reduced to 420 trees/ha. and 400 trees/ha.respectively. For APM, these would reduce to 382 and 365 trees/ha.respectively.

9/87 Indirect selection for oil yield in oil palm clones

SAC

SUMMARY

Recently, Soh (1986) reported the low heritability (broad-sense) for yield (oil yield) in current DxP materials and the consequent expected yield improvement of about 13% with the clones derived. Using data from one of Soh's (1986) trials, this paper examines the possibility of improving yield selection efficiency by selecting on supporting yield component and physiological traits singly and in combination in selection indices.
Selection for low kernel to fruit alone was expected to be 33% more efficient than direct yield selection while its selection in combination with bunch number, mesocarp to fruit and yield in a selection index, an improvement in selection efficiency of 65% would be achievable. Selection on low height, high bunch index and leaf area ratio individually would be inferior to direct yield selection while their inclusion with yield components in the selection indices would not improve selection efficiency appreciably. However, the real advantage of selection on these physiological traits can perhaps be only ascertained from actual clonal tests.

It is suggested that the selection index method would be put to most profitable use on DxP/T materials derived from more outbred materials.

7/87 Urea experience in plantation tree crops in Malaysia

CPS & PE

SUMMARY

The bulk of the nitrogen consumed in Malaysia is used in the tree crop plantations. Usage of urea however is still limited despite the possible significant advantages from the high N content and low unit N costs. The principal reasons for the restricted use of the fertiliser are the large volatilisation losses recorded, scarcity of experimental data with use of the fertiliser and the difficulty in predicting results in the field when urea is broadcast on the soil surface. A review of the experimental results and research todate has identified the critical factors of soil, climate and management affecting volatilisation losses of urea in the common plantation tree crops and necessary practices required to minimise these losses to achieve comparable responses in growth and yield to other nitrogenous fertilisers. Attention to these factors and a modification of existing fertiliser application practices to minimize volatilisation losses will overcome the probelms of poorer results recorded with urea in many comparative trials todate and also reduce variability of results obtained. The large scale, variability of micro-climatic and soil conditions, high tonnage of applications, high degree of dependence on manual application methods still and lack of reliability of rainfall forecasts at most times of the year are large managerial constriants to successful use of urea. Maintenance of the quality of urea, improved forms of the fertiliser and use of various additives and promising inhibitors will help reduce the high burden on management to efficiently use the fertiliser.

To detect mishaps, more critical methods and techniques of monitoring of the N-uptake results and N nutrition of the plantation crops require to be developed to back up management. The current thrust in urea research for plantation crops as a result of commencement of local urea manufacture will hopefully provide further experimental proof of the soundness of practices now advocated and develop more reliable techniques and urea products for use by the vital plantation industry in the country.

10/87 Use of palm oil by-products in urea fertilisers

CKS & CPS

SUMMARY

Some of the factors that discourage the widespread usage of urea in plantations are its high volatilisation loss on surface application, the tendency to cake on prolonged storage in the case of prill urea and the high hygroscopicity when mixed with other fertilisers in a NPK compound. This paper examines the prospects of using materials derived from palm oil and its by-products as coating and binding agents for urea fertilisers. Improvements resulting from the coating of urea fertilisers with a palm fatty acid distillate (PFAD) are the reduction of caking in prill urea, the reduction of moisture absorption in urea and urea-based NPK compound and better resistance to leaching. When used in conjunction with urease inhibitors, PFAD acts as a binder in the amendment to reduce volatilisation loss. As PFAD is readily available locally, greater emphasis should be placed on utilising this material for improving the properties of urea where feasible.

11/87 Boric acid and fertiliser borate for improved urea fertiliser efficiency

CKS & CPS

SUMMARY

High grade fertiliser borate (HGFB) and boric acid, both boron compounds, can be added to urea to reduce volatilisation loss during surface application of urea. The inhibitor may be incorporated into urea either by adding the inhibitor to molten urea or by using a binder to hold them together.

Laboratory studies with Serdang Series soil using urea treated with boric acid or HGFB showed that volatilisation losses were reduced by these inhibitors. The effect of concentration was very highly significant, the higher the concentration of inhibitor, the lower the loss. Boric acid appeared to be more effective than HGFB and it is possible that this may be due to the formation of a boric acid-ammonium complex.

In field conditions under oil palm on Serdang and Selangor Series soils, average volatilisation losses using an amendment consisting of 4% boric acid and 2% binder were reduced from about 30% to 20% at application rate of 250 kg N/ha. and from about 37% to 26% at application rate of 500 kg N/ha. Since boron is an essential trace element in oil palm, boric acid and HGFB may have, an advantage over other urease inhibitors for urea application in oil palm.

Other Papers

5/87 Report on the 2nd Annual Conference of the International Plant Biotechnology Network (IPB Net)11-16/1/876, Bangkok

TCC & GV

4/87 Dr. J. D. Mumford's talk in *Conopomorpha cramerella* 21/1/87, Kuala Lumpur

MMM

6/87 Report on bagworm infestation in Ladang Coalfields

MMM

8/87 Report on the outbreak of *Setora nitens* in KDC estates, Sabah

MMM

Editor's Note :

Did you receive our first issue of the Newsletter circulated in March? If not, please let us know. We have very few copies left for distribution.

Are your Assistants and staff reading their copies? The Newsletter may also be of interest to them.

SPECIFIC RECOMMENDATIONS CONTAINED HEREIN SHOULD ONLY BE IMPLEMENTED WITH PROPER AUTHORISATION